IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Joar Vaage
Appl. No.:	09/936,390
Filed:	September 10, 2001
Docket No.:	1781
Conf. No.	3776
Title:	***A METHOD AND AN APPARATUS FOR STEREOPROJECTION OF PICTURES***
Art Unit:	2872
Examiner:	Chang, Audrey Y
Action:	***DECLARATION OF ANNE SOLVEIG TØNNESEN UNDER 37 C.F.R. §1.132***
Date:	May 27, 2005

To: Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Anne Solveig Tonnesen declares as follows:

1. My name is Anne Solveig Tonnesen and I am a Program Manager at Cyviz AS, located in Stavanger Norway, which is the owner of this application. I hold a Master of Science Degree in Physics from the University of Bergen. I am also in the progress of obtaining a master degree in management from the BI, Norwegian School of Management. I have completed 2/3 of my coursework (organizational psychology and organizational communication), and need a third course to complete that degree, which I anticipate completing by 2006. Attached to this declaration as Exhibit 1 is my curriculum vitae which explains my qualifications in greater detail.

2. Cyviz AS specializes in providing high-end visualization equipment for passive stereo and high resolution. As part of my job responsibilities with Cyviz AS I am intimately involved in the R&D for all projects, the company's patent portfolio, as well as process and quality management. I have also had extensive experience in optics technologies which I believe qualifies me to offer my comments with regard to the present application.

3. I have been asked to comment about certain US patent documents which have been cited against the company's pending patent application, Serial No. 09/936,390, which is bears the title "A METHOD AND AN APPARATUS FOR STEREOPROJECTION OF PICTURES". It is my understanding that the examiner handling the application at the USPTO has rejected each of the claims based on the assertion that the invention is obvious. More specifically, I am aware that a primary reference (US Patent No. 5,959,663 to Oba et al.) is being relied upon either alone or with the teachings from other references (US Patent No. 5,726,703 to Izawa et al. or US Patent No. 5,982,538 to Shikama et al.) to reject pending claims 1-12 which were presented in an earlier amendment.

4. I have reviewed the above patents, as well as the examiner's office action mailed on 30 November 2004 and the pending application, each in its entirety. While I have studied certain passages within these patents which have been particularly referred to by the examiner, my opinions nonetheless take into account each of the patent document(s) as a whole. I believe that my particular

knowledge, my background experience in areas relating to this invention, and my consideration of these patents qualifies me to offer the opinions in this declaration. Based on my review of these various materials, I respectfully disagree with many of the examiner's conclusions and offer the following observations in support of patentability.

5. I would like to begin by briefly discussing video imaging in general, as well as each of the above patents, as this will provide a framework for my opinions.

6. **STEREOSCOPY**: Stereoscopic imaging is used for the case where you see one image with the left eye and one image with the right eye and thus the brain triangulates the information to create a 3D experience which includes depth information. Monoscopic, on the other hand, is used for the case where both eyes see the same information or image and there is no depth information.

7. One of the standard stereoscopic video signal formats (referred to as a single signal format) can be described in the following way: In the single signal format a stream of alternating image frames are provided so that a first and every odd numbered image is intended for a first eye (e.g. the left eye), while a second and every following even numbered picture is intended for the second eye (e.g. the right eye). In parallel with the stream of alternating left and right images, there is a synchronization signal that provides appropriate timing.

8. The most common way of watching these kinds of stereo signals is by displaying the complete video signal, as is, showing every image frame on a

single display device and using active liquid crystal shutters to alternately block or open the corresponding eyes of the viewer, in unison with the synchronization signal.

9. The single signal format has some limitations. For example, the frame rate handling capability of the display may cause the frequency to be limited, which normally results in flickering. Flicker occurs because of limitations in the displays or the polarizing Liquid Crystal Shutter glasses. This can also be a limitation of the actual display technology being used.

10. Another stereoscopic video signal format (referred to as the dual signal format) has two separate signals -- one signal containing the left eye information and another signal containing the right eye information. The two video signals will then appear to be similar to a regular video signal, and can be viewed alone as a regular video signal. If you use both signals to get the stereoscopic effect, some time domain synchronization must be present.

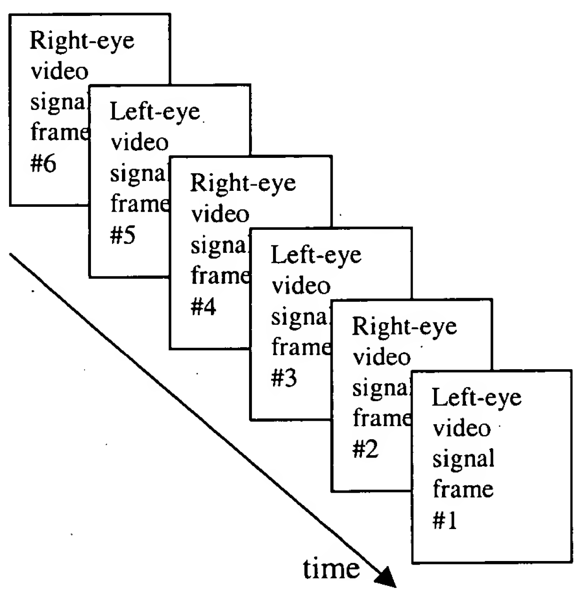
11. The table on the following page shows the type of incoming video signal(s) used in the various patents which have been cited by the examiner, as well as the present application.

Video signal	Display type	Patent/Patent App.
Regular 2D video (monoscopic)	2 projectors	Oba et al
Two separate streams	1 projector	Shikama et al
Video signal with alternating left and right eye information	2 projectors	Present Invention
Video signal with alternating left and right eye information	1 projector	Izawa et al[1]

12. I have also included below diagrammatic representation which illustrates the differences between incoming 2D signals and 3D signals.

Input video signals:

<u>Stereoscopic image signal with alternate left and right eye images:</u>



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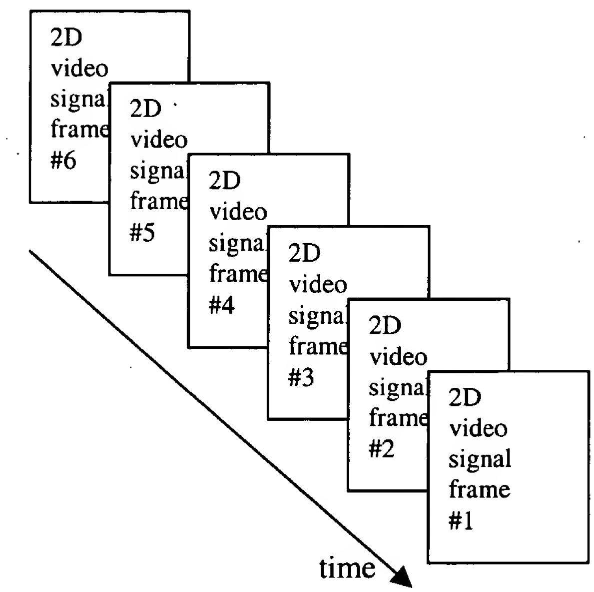
[1] Izawa et al also describes a setup with more than one projector, but as I will explain later, all the projectors individually show left-eye and right-eye images alternately.

Every second image frame is viewed from a slightly different angle corresponding to the different view from a left and a right eye.

Regular monoscopic video signal :



All the video signals are viewed from the same angle/position.

13. **U.S. PATENT NO. 5,959,663 TO OBA ET AL.** On the surface the Oba et al. device and that described in the present application may appear similar. Broadly speaking, each receives an incoming signal, does something with it, and sends signals to left and right projectors for the purpose of displaying stereoscopic images on a screen which can be viewed using spectacles with polarizing glasses to observe a 3D effect. However, in considering the two approaches more thoroughly, significant differences become apparent.

14. Oba et al. describes a device which receives regular 2D (monoscopic) video input signals, artificially makes a left and a right image signal using an operator setting or default values, and sends the constructed left and right image signals to a left and a right projector, respectively.[2] Thus, for each image frame received in standard 2D format, the Oba et al device creates two new image frames (i.e. pictures) -- one intended for the left eye and one intended for the right eye. This is accomplished by image processors 22L and 22R. This generation of the 2 new sets of signals is based on arithmetic calculations using spatial image transform matrices. This transformation process rotates and moves the individual pixel information within the original signal frames to new positions or addresses inside each individual frame. The result is a rearrangement of the pixels for each of the left and right eye display. This generates an artificially constructed stereoscopic effect when the new left-eye image and right-eye image are viewed simultaneously using appropriate viewing spectacles.

15. Importantly, Oba et al does not describe how to receive and sort an incoming, ready made 3D signal (i.e. one which alternates cyclically between left

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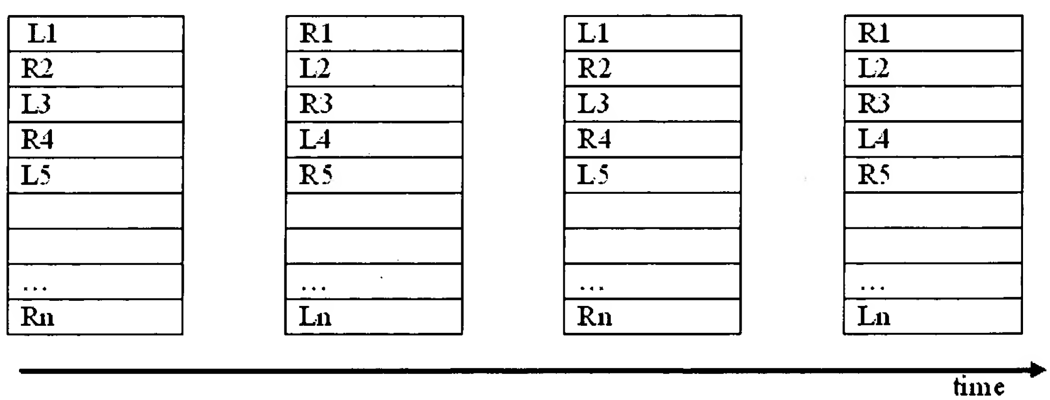
[2] I consider these to be constructed 3D images, and not true 3D images since they are derived by adding information to the incoming 2D signal which was not originally there.

and right pictures). Rather, Oba et al. teaches a device which artificially fabricates a 3D format from a 2D video format.[3]

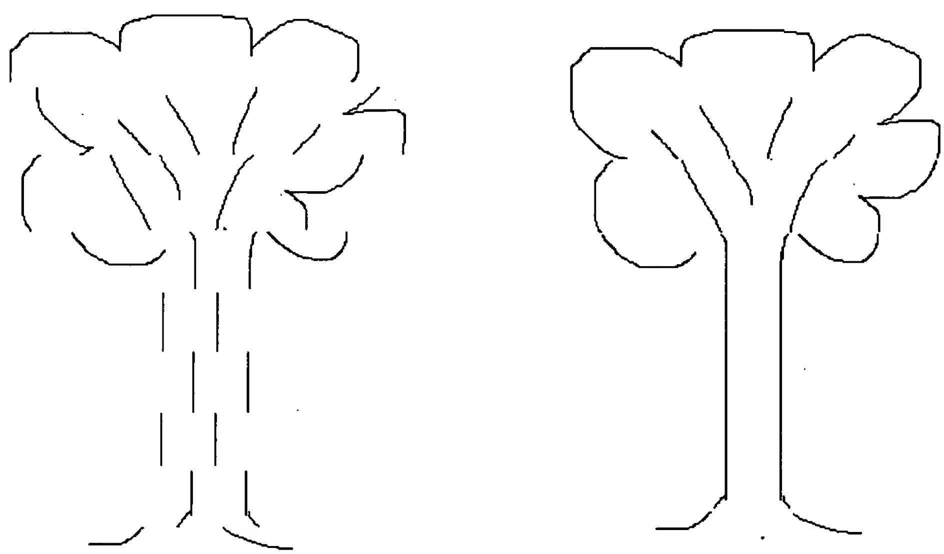
16. **U.S. PATENT NO. 5,982,538 TO SHIKAMA ET AL.** Without entering into a detailed analysis of the optical system described in Shikama et al, I will briefly describe how they treat the image signals.

17. A first and a second image signal comprise the input signals to the device containing image information intended for the left and the right eye, respectively. Each input image signal is stored in a respective frame memory. When the image is displayed on the light valve, odd numbered rasters are modulated by the first image signal and even numbered rasters are modulated by the second image signal, as illustrated below.



[3] As a general observation, it is difficult to add more information (e.g. depth) to an image beyond what is already in the original 2D signal data, and it can have an effect on the final quality of stereoscopic images which are generated according to this method.

18. In this way every displayed picture frame is a mix of the left and the right input signals. The resulting effect, as illustrated below, is that every picture frame displayed is interlaced with every second line or raster for the right or the left eye. The viewer will use polarized glasses so that the odd numbered lines are viewed with the left eye and the even numbered lines are viewed with the right eye.



19. The left image above is the image on the display or light valve, showing every second line or raster with left eye information and the other lines showing right eye information. The right image above is what the incoming picture signal for one of the frames look like. Using a corresponding polarization device to add polarization direction of the light according to the same rasters or lines, one can see a stereoscopic image using spectacles with corresponding polarizing filters.

20. Obviously, the resolution will be higher than the above representation indicates, but a potential drawback to this type of device is that, unless the frequency of the image generation is suitably increased, it could result in a loss of half of the image since every second line from the picture signal would be lost. Using LCD panels as suggested by Shikama et al, the frame rate does not appear capable of displaying new frames at the necessary speed to avoid loss of information.

21. It is my belief that the approach described in the Shikama et al patent can, for the most part, only be used inside display devices for light valve types which write the image in a raster-type manner. Examples of such devices are Liquid crystal displays (LCDs) or Cathode Ray Tubes (CRTs). Shikama's approach might also write the information on digital displays, but the optical systems belonging to these displays would be incompatible, or at least not of practical use with today's technology.

22. **U.S. PATENT NO. 5,726,703 TO IZAWA ET AL.**. This patent shows, for example in Fig. 20, how multiple projectors form a display system. The right projection device 50R and the left projection device 50L are secured to each other at adjacent side portions, thus forming a right part and a left part of a total

image with higher resolution, bigger display size or higher brightness values than a single projection device.[4]

23. Each projection device has an upper and a lower projection CRT unit, adding up to a total of four CRT projection units as shown in the 2 x 2 matrix of Fig. 20. Quoting from column 3, lines 16-20 of the reference: "***Each*** of the projection units has left/right stereoscopic image signal generator means for alternately generating RGB signals of a left-eye image signal and a right-eye image signal having a parallax at every field, ..." (emphasis added). Claim 8 of the patent states in part: "A stereoscopic image display system comprising: a plurality of projection units arranged vertically or horizontally, **each of the projection units** including left/right stereoscopic image signal generator means for **alternately generating** red, green, blue (RGB) signals of **a left-eye image signal and a right-eye image signal** having a parallax at every field ..." (emphasis added).

24. Having described the various references relied upon by the examiner in the office action, I will now address specific statements made by the examiner in which the reasons for rejecting the claims are given. Since each of the

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[4] As argued in a previous communication to the examiner, projecting adjacent portions of an overall image using multiple projectors is distinctly different than dedicating one left projection device intended for a left eye and one right projection device intended for the right eye, which have their respective left and right images projected onto the same physical space.

examiner's statements which I address are contained within § 6 of the Office Action, I will refer to their location by page and paragraph number.

On p. 3, ¶ 2 of the Office Action the examiner states:

> "Oba et al teaches s *stereoscopic image generation* and *projection* method and apparatus, wherein the *an input video signal* (V_A), comprising picture signals intended for left eye and right eye is transferred to *a first and second projector* (23L and 23R, Figure 6), via a *first and second path.*"

In my opinion the Oba et al patent does not support such a statement. Throughout the descriptions in the Oba et al patent, the input signal is a standard 2D video signal, and <u>not</u> one which originally contains pictures intended for the left and the right eye separately. This generation of left-eye image signals and right-eye image signals is carried out inside the Oba et al apparatus using the image transform algorithms supplied, but they are certainly not present in the incoming video signal (V_A).

25. I believe a more accurate characterization than that offered by the examiner is that the incoming signal in Oba et al. has information which Oba et al. intends to ultimately be viewed as pictures by the left and right eyes. Importantly, though, the "pictures" are derived the incoming signal by processors 22L and 22R. Claim 1 of the present application recites that the incoming picture signal alternates between "pictures" intended for the left and right eyes. This

cannot be said of Oba since the actual pictures are generated downstream of the incoming signal and are not initially present within it.

26. Also on p. 3, ¶2 the examiner states:

> "The left eye picture signal and right eye picture signal are *processed* by left eye processor (22L) and right eye processor (22R) respectively which implicitly includes *decoding* the signal and *storing* the signal in *frame memory* (36L and 26R), that serves as the first *and second picture storage*."

27. I believe this statement is also incorrect. On the one hand, if the left and right picture signals were processed by processors 22L and 22R, this would imply that they exist before reaching the processors. As I mentioned above they are instead constructed within the processors 22L and 22R.

28. Moreover, the description in column 14 of Oba et al describes that processors 22L and 22R respectively generate left-eye and right-eye stereoscopic image output signals VL_{OUT} and VR_{OUT} from an input video signal V_A, an input key signal K_A, and an input background signal V_{BK}. Oba et al. thus teaches that <u>the same incoming signals</u> (V_A, K_A, and V_{BK}) are going to the two processors (22R and 22L) to generate the output right and left image signals. This can be readily seen in Fig. 6. In other words, the same 2D signals are sent to both processors together with a key signal to give the requested depth in the final image. Therefore, there are no left-eye and right-eye picture signals that are respectively processed by a left eye processor and a right eye processor.

29. The incoming 2D signal V_A is transformed by processor 22L to a calculated left portion of a new 3D image and the <u>same</u> incoming 2D signal V_A is transformed by processor 22R to a calculated right portion of the new 3D image. Hence the incoming 2D signal is generated into two new signals and, thus, there is no decoding which takes place as claimed in the current application. The resulting left-eye picture signal frames and right-eye signal frames are then temporarily stored in frame memories. In my experience, temporal storing of image signals will always occur in these types of devices.

30. In addition to the above, another difference between the Oba et al. device and that described in the present application is that, in Oba et al., the path from the frame memory to the projector is longer <u>and</u> the image is further processed on its path to the associated projector. The specific procedure for further processing of the image is described at column 15, lines 21-25 where Oba et al. states: "Image data VL_1 and VR_1 read out from the frame memories 36L and 36R of the left-eye and the right-eye processors 22L and 22R are interpolated at video signal interpolation circuits 40L and 40R, and then are supplied to the combiners 41L and 41R as read-out video signal VL_2 and VR_2." Then, the path to obtain read-out key signals KL_2 and KR_2 (*an apparent typing error in the patent at lines 31-32 where read-out video signals are indicated instead*) from the key data KL_1 and KL_2 is described. Finally, the equations to combine the input background signal V_{BK}, the read-out key signals KL_2 and KR_2 and the read-out

video signals VL_2 and VR_2 to the final stereoscopic output signals VL_{OUT} and VR_{OUT} are given in equations 90 and 91. From this description it is apparent that the frame memories described in Oba et al store only part of the image information for each incoming frame, not the complete picture frames delivered to the projectors.

31. On p. 3, ¶3 the examiner states:

> "This reference [Oba et al.] has met all the of the claims. However it does not teach explicitly that the video signal is *alternating* cyclically between the left-eye picture and the right-eye picture signals. However it is implicitly true that the left-eye signal and the right-eye picture signal are *separately processed*, which with regard to claim 2, this implies a *page selector is included* to allow the left eye picture signals and the right eye picture signals being transmitted via a first and a second path to the left eye and right eye projectors."

32. I respectfully disagree with this statement, as well. As stated above, since the input signal in the Oba et al patent is a standard 2D video signal there are no alternating left eye image signals and right eye image signals in the input video signal that can be selected. Therefore, since there is no cycling which occurs, there is no existence of (or need for) a page selector. More particularly, since the purpose of a page selector in the present invention is to separate out the left and right images within the incoming 3D signal, the incorporation of such a feature into the device of Oba et al. would be pointless since there are no left and right images that need to be separated in the first place.

33. However, assuming arguendo that one did include a page selector into the Oba et al. device, it would parse the incoming 2D signal by separating the even and odd frames, which would then be sent to separate branches. Doing so, however, would disrupt the timing sequence within processors 22L and 22R and cause the left and right projectors to operate at ½ the frequency of the incoming signal. Also, the projectors would no longer project their images simultaneously.[5] To the viewer this might appear as images which flicker or become incoherent and unintelligible. In any event, the result would be images which are of lesser quality than intended.

34. With regard to the Izawa et al. reference, the examiner maintains on p. 3, ¶3 that it is very common to have input video signal with alternating left eye and right eye pictures which are respectively transmitted to left and right projection devices. Applicant does not necessarily disagree with this characterization. The examiner then goes on to state on the following page:

> "**Izawa** et al teaches that a *changeover circuit* (2, Figure 25) can be used to *select* the left-eye or right-eye image signals (please see column 1, lines 20-23). (Noted the image signals from the image generator are processed before it become final transform image for projection, Figure 3). It would then have been either implicitly true that the left eye picture signals and right eye picture signals are input *alternatively* or it would have been obvious to one skilled in the art to apply the teachings of **Izawa** et al

[5] It is important to note that Oba et al. specifically intends to project the left and right images simultaneously. This can be readily appreciated in Fig. 6 which shows the simultaneous branching of the same incoming 2D signal to the left and right channels.

to modify the system to do so for the benefit of allowing the left eye and right eye picture signals being input in an easy manner."

35. Izawa would select the even or odd images to transmit the next image onto the same path regardless of being odd or even. The purpose of this selection is for the timing to be accurate towards the LC shutter spectacles used to watch the image. As stated above, though, it is certainly not the case (either explicitly or implicitly) that Oba et al. utilizes a 3D incoming video signal. Thus, regardless of the separate teaching in Izawa et al., there would be no reason to incorporate the Izawa et al. teachings into Oba et al. since they relate to the processing of completely different types of input signals.

36. The examiner states at p. 3, ¶1:

> "Oba et al teaches that the image data representing the input video signal is written in and its read-out address is specified corresponding to the *raster scan address* on the screen which then allows the *generation* of the left eye and right eye final transform images (V5L and V5R) be transferred to the left eye and right eye projectors (23L and 23R) and be projected on the screen (24) at the *same time*, (please see figures 6-7, column 14)."

37. For each output pixel, the Oba et al. process calculates an address to a pixel from the input image storage. The result is a rearrangement of the pixels for each of the left and right eye display.

38. The examiner goes on to state at p. 4, ¶2:

"Oba et al teaches that the final transformation images (V5L and V5R) that are being transmitted to the projectors have a read out address that is corresponding to the **raster scan address** on the screen. This implies that periodically scanning is used to produce the image signals for projection."

39. Unlike Oba et al., the present invention does not process pixels individually, but rather pages/frames. As to the contention by the examiner that Oba et al. implicitly teaches periodic scanning to produce the image signals, the only references I can find which relate to a periodic event in the Oba et al patent pertains to the <u>sequential</u> supply of read-out addresses to the read-out generation means. These references may be found at Column 14, line 60 through Column 15, line 6; Column 15, lines 22-46; and claims 5 & 13. In my opinion, these passages do not necessarily imply periodic scanning.

40. Also on p.4 ¶2 the examiner states:

"It is also very well known in the art to use scanning unit to scan the frame memory of the display device to generate the image. **Shikama** et al in the same field of endeavor *explicitly* teaches a light valve for an image projector has right image frame memory and left image frame memory for storing the right and left image field respectively wherein a *scanning unit* (40, Figure 3) is used to *periodically scan* the memory frames to generate the right and left image signals for projections. It would then have been obvious to one skilled in the art to apply the explicit teachings of **Shikama** et al to provide image memory frames for left eye image and right eye image respectively and scanning circuit for scanning the frame memory in order to produce the image signals for projection efficiently."

41. Regarding the point raised by the examiner that Shikama et al teaches a periodic scan that is used to generate the right and left image signals for

projection, Shikama et al describes a different way of scanning than the current application. Shikama et al teaches to scan one raster[6] (in the case of an LCD light valve described in the patent, one line of picture information) at a time from the left and the right frame memory, respectively, thus generating a new frame or image written to the light valves consisting of left eye and right eye information interlaced.

42. In the present application, the picture generator scans between the first and the second picture area inside the picture storages (i.e. frame memories) 5 & 6 to select which picture or frame to transmit to the attached projector. This happens in both the left and the right image channels. More particularly, the left storage area is scanned by the left image generator for a complete frame to be directly displayed in its entirety on the left projector, and the right storage area is scanned to retrieve another complete image frame to be displayed on the right projector (see Fig.1 of the present application). In this case the paths are completely separated -- all the information in the left storage area is displayed on the left projection device and all the image information in the right storage area is displayed on the right projection device.

[6] One raster is the amount of information written to the display at a time, so that you scan raster by raster until the complete frame has been displayed and then you start again to write the next frame.

43. The examiner goes on to state at pp. 4-5:

> "With regard to claims 5-6 and 10-11, Oba et al teaches that the left eye transform image and right eye transform image (V5L and V5R) are each generated by a first and second image processors (22L and 22R) and the processors are coupled to the left eye and right eye projectors (23L and 23R) respectively. These references do not teach explicitly that if the scanning rate is different than the incoming rate of the picture signal however since these picture signals are processed first by the processor, the rate could be different from the incoming rate depending on the processing rate."

44. It appears, then, that the examiner is maintaining that, in Oba et al., the projected frame rate might be different than the incoming frame rate due, for example, to processing delays. However, even if this were the case, I do not see a teaching in Oba et al. that their device has the ability to correct this. In fact, Oba et al. states that the timing is the same through the entire system. For example, Oba states the following beginning at column 2, line 61 (emphasis added):

> "Further, the source video signal is **moved continuously** by frames in the three-dimensional space based on the operator's operation, the right-eye video signal and the left-eye video signal **in real time** interlocking **with the continuous movement of the source video signal.**
>
> Further, the simultaneous image transform process based on one input video signal at the time of generating the left-eye and right-eye images **removes such complicated process as re-synchronization** of the left-eye and right-eye images, which makes it possible to generate much better stereoscopic image. Accordingly, it is possible to display the left-eye video signal and the right-eye video signal synchronizing with each other all the time on the screen."

Also in column 17 beginning at line 26 the timing is explained, where Oba et al discusses that the processing is done simultaneously in both channels. The reference, however, does not appear to comment on whether the rates change or if there is any way to correct changes if they were to occur.

45. In fact, since the two frame memories in Oba et al. do not have more than one storage area (unlike the present invention) it follows that Oba et al. reads and processes at the same speed as the incoming signal rate because, otherwise, the signals would become mixed.

I, the undersigned, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, declares that the facts set forth in this declaration are true, all statements made of my own knowledge are true, and all statements made on information and belief are believed to be true.

Further declarant sayeth not.

Dated: 27 MAY 2005 By: ______________________
Anne Solveig Tonnesen

Curriculum Vitae

PERSONALIA

Name:	Anne Solveig Tønnesen
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WORK EXPERIENCE:

Employer	*Time*	*Title*
Cyviz AS:		
	Mar 05 – Present	Program Manager
InFocus Corporation:		
	Dec 03 – Feb 05	Optics Manger / Chief Eng.
	Nov 01 – Dec 03	Optics Manager
	Apr 01 – Nov 01	Project Manager
	Apr 96 – Mar 01	Optics Designer
University of Bergen:		
	Jan 96 – Apr 96	Consultant, Faculty of Mathematics and Natural Science
	Fall 93, 94 & 95	Undergraduate Teacher, Physics Institute
	Spring 93, Fall 93	Undergraduate Teacher, Mathematics Institute
Philips Petroleum:		
	92 & 93	Summer intern, Reserves & Planning
	89, 90 &91	Summer/Winter intern, Different dept's

EDUCATION:

Time	*Duration*	*Description*	*Institution*
04 – 05	30 points (½ year)	Communication in Organizations	BI, Norwegian School of Management
02 – 03	30 points (½ year)	Organizational Psychology	BI, Norwegian School of Management
90 – 95	5 years	Master of Science, Physics	University of Bergen

PUBLICATIONS:

Anne Solveig Tønnesen, Jakob J. Stamnes and Torolf Wedberg: *Three-Dimensional Optical Diffraction Tomography by Two-Dimensional Sectioning.* Oral presentation, Optics & Optoelectronics Conference, 5.-8. September 1994 in York, UK

Anne Solveig Tønnesen, Jakob J. Stamnes and Torolf Wedberg: *Three-Dimensional Optical Diffraction Tomography by Two- Dimensional Sectioning.* Poster presentation, Norsk Elektro-optikkmøte, 23.-26. April 1995, Ustaoset, Norway

LANGUAGE SKILLS

Norwegian	Native. Fluent, written and spoken (both Bokmål and Nynorsk)
English	Fluent, written and spoken
German	Good spoken, Fair written
Danish/ Swedish	Good understanding

DESCRIPTION OF KEY CHARACTERISTICS

My experience includes product development, program management, supplier selections, process development, people management and training of manufacturing, quality engineers and marketing people in addition to optical design. I have an excellent technical understanding and have demonstrated good communication skills in an international environment. I am analytical of nature and perform well under pressure. I am open, outgoing and dedicated, and I find it easy to be enthusiastic about my work when I am busy and things are happening fast.

Work Experience

Cyviz AS – Program Manager

Cyviz AS is a specialised provider of high-end visualization equipment for passive stereo and high resolution. My responsibility includes:

- R&D Roadmap and technical direction
- R&D Management including personnel, resource allocation and budgets
- Project Management for all projects
- Supplier selection
- Patent portfolio
- Process and quality management

InFocus Corporation

InFocus Corporation –Optics Manager / Chief Engineer

The Research & Development Department at InFocus was organized as a matrix organization spanning over two departments (Wilsonville, Oregon and Fredrikstad, Norway), and I was responsible for a group of engineers across the different market segments and both development sites. My responsibility included the following tasks:

- Main responsibility for strategy and technical direction for lamps, screens, displays, optical components and systems.
- Main responsible for technical communication with suppliers inside the above mentioned areas.
- Responsible for the optics development inside InFocus Corporation, continuous functional development and training for optical designers and engineers.
- Resource management of optical designers and engineers
- Participating in cross-functional team with supply chain management and quality engineering for strategic selection of suppliers and partners and for qualifying new suppliers.
- Participation in product definition phase for all new products across all the product families and overall roadmap planning for InFocus.
- Development and coordination of routines and development processes for documentation, design and working with co-development partners.
- Responsible for advanced development and research programs with optical engineering for future programs

I was responsible from R&D for a project to determine the value of the intellectual property and knowledge base for R&D in Norway. This work was done in cooperation with Ernst &Young in the timeframe Jan 04 – April 04.

InFocus AS – Optics Manager (Norway)

My position as Optics Manager included the following tasks:

- Personnel and budget responsibility for the optics group, including hiring and training of new engineers.
- Responsible for resource management according to programs and coordination with other departments.
- Development and implementation of routines for documentation and process control.
- Participating in cross-functional team with supply chain management and quality engineering for strategic selection of suppliers and partners and for qualifying new suppliers.

- Responsible for strategy and technical direction for lamps, screens, LCD displays, optical components and systems.
- Main responsible for technical communication with suppliers inside the above mentioned areas.
- Overall program management responsibility for optical products and optical architectures for products developed in Fredrikstad.

We had about 1 year without an R&D Director in Norway and during this time I was participating in the extended leadership group for InFocus Corporation and member of the Management group for Fredrikstad Site (Jun 02 – Feb 03).

InFocus AS – Project Manager
I was the project manager for development and introduction of the projector ASK C300 (also marketed as Proxima DP8000 and InFocus LP790). The work consisted of coordination of activities for different internal functional groups and individual engineers, towards other departments as product marketing in the US, production, sales and external suppliers.

ASK/Proxima (now InFocus) – Optics Designer
The R&D department was rather small and I reported directly to the R&D Director. I was responsible for development and design of optics for various data- and video-projectors; the last one was ASK M3/Proxima X350. As the company was building up and the industry changed rapidly, I was deeply involved in building up the R&D department, the supplier base and the strategic direction of the company and the products. The work included the following tasks:

- Definition and design of optical systems
- Testing of prototypes and creation of manufacturing documentation and training for manufacturing staff.
- Participating in cross-functional team with supply chain management and quality engineering for strategic selection of suppliers and partners and for qualifying new suppliers.
- Made studies and suggested strategy for display technologies for future use.
- Analysis of competing products
- Problem solving connected to quality issues in manufacturing
- Give lectures and training for marketing, sales and manufacturing staff.

Universitetet i Bergen – Førstekonsulent/Consultant
The work at University of Bergen included general casework, updating and maintenance of database, and student counseling.

Education

Management Classes from BI, Norwegian School of Management
I have completed two thirds of a program to achieve a Master of Management degree at BI, Norwegian School of Management. Topics studied include organizational psychology, communication, management skills etc.

Master degree from the University of Bergen
The education from University of Bergen had duration of 5 years and consisted of the following topics: physics, mathematics, chemistry and numerical analysis. The thesis consisted of 1.5 full year research where I programmed theoretical models and compared different approximations to the exact method on the subject electromagnetic and acoustic wave propagation.